Patent claims

1. A circuit arrangement,

- comprising a plurality of series-connected resonator circuits, it being possible for an output signal of a resonator circuit that is respectively connected upstream to be provided as an input signal to the resonator circuit that is respectively connected downstream, each resonator circuit being set up for generating an output signal from an input signal and having:
  -- a capacitance and an inductance,
  -- an input at which the input signal can be provided,
  -- an output at which the output signal can be provided;
- having a control circuit for the open-loop or closed-loop control of the quality factor of the resonator circuit, the control circuit being set up in such a way that it controls the quality factor of the resonator circuit in an open-loop manner or in a closed-loop manner depending on the signal profile of the signal amplitude of the input signal and/or of the output signal.

2. The circuit arrangement as claimed in claim 1, in which the resonator circuits have a nonreactive resistance that can be controlled by means of the control circuit.

3. The circuit arrangement as claimed in claim 2, in which

- the input signal can be provided between a first terminal of the nonreactive resistance and a first terminal of the capacitance;
- the output signal can be provided between the first terminal of the capacitance and a second terminal of the capacitance;

- second terminal of the nonreactive resistance is coupled to a first terminal of the inductance and a second terminal of the inductance is coupled to the second terminal of the capacitance.

4. The circuit arrangement as claimed in one of claims 1 to 3,
in which the control circuit is set up in such a way that it controls the quality factor of the resonator circuits based on a Boltzmann function and/or the derivative thereof, the Boltzmann function containing the amplitude of the output signal as a parameter.

5. The circuit arrangement as claimed in one of claims 1 to 4,
in which the control circuit is set up in such a way that it sets the quality factor of the resonator circuits in a manner dependent on the amplitude of the output signal based on a sensitivity characteristic determined for an ear of a human being.

6. The circuit arrangement as claimed in one of claims 1 to 5,
in which the control circuit is set up in such a way that it sets the quality factor of the resonator circuits to be lower, the higher the amplitude of the output signal.

7. The circuit arrangement as claimed in claim 6,
in which the control circuit is set up in such a way that it sets the quality factor of the resonator circuits in a nonlinear dependence on the amplitude of the output signal.

8. The circuit arrangement as claimed in one of claims 1 to 7,
in which the control circuit is set up in such a way

that it sets the quality factor of the resonator circuits in such a way that the amplitude of the output signal is within a predetermined interval.

9. The circuit arrangement as claimed in one of claims 1 to 8,
in which the second terminal of the coil of a resonator circuit connected upstream is coupled to the first terminal of the nonreactive resistance of the resonator circuit connected downstream of the resonator circuit connected upstream.

10. The circuit arrangement as claimed in one of claims 1 to 8,
comprising an operational amplifier between a resonator circuit connected upstream and the resonator circuit connected downstream thereof,

- a first input of the operational amplifier being coupled to the second terminal of the coil of the resonator circuit connected upstream;
- a second input of the operational amplifier being feedback-coupled to the output thereof and being coupled to the first terminal of the nonreactive resistance of the resonator circuit connected downstream of the resonator circuit connected upstream.

11. The circuit arrangement as claimed in one of claims 1 to 10,
in which the quality factor of all the series-connected resonator circuits is set in identical fashion.

12. The circuit arrangement as claimed in one of claims 1 to 10,
in which the quality factor of each of the series-connected resonator circuits is set in individual fashion.

13. The circuit arrangement as claimed in one of claims 1 to 12,
comprising a plurality of parallel-connected branches, each of which has a plurality of resonator circuits connected in series with one another, it being possible for the quality factor of a respective resonator circuit to be controlled by means of the control circuit.

14. The circuit arrangement as claimed in claim 13,
in which the resonator circuits of a respective branch are set up in such a way that they are transmissive for a respective frequency range of the input signal in such a way that the branches are jointly transmissive for a contiguous frequency interval.

15. The circuit arrangement as claimed in claim 14,
in which the frequency ranges for which the different branches are transmissive overlap one another at least partially.

16. The circuit arrangement as claimed in claim 14 or 15,
in which the frequency range for which a respective branch is transmissive can be predefined by means of setting the value of the capacitance and/or the inductance of the resonator circuits of the branch.

17. The circuit arrangement as claimed in one of claims 1 to 16,
which is set up for processing an acoustic signal as input signal.

18. A signal processing device
- comprising a circuit arrangement as claimed in one of claims 1 to 17;

- comprising a further processing unit for further processing of the output signal.

19. The signal processing device as claimed in claim 18,
in which the further processing unit is
- a speech recognition device; or
- a hearing aid.

20. The signal processing device as claimed in claim 15 or 16,
set up as an analog filter bank or as a digital filter bank.